

The Value of Intra-workout Nutrition with Regards to the Immune System



APPLIED NUTRITION

AMINO FUEL
ESSENTIAL AMINO ACIDS

ULTIMATE AMINO FORMULA

0G FAT 0G SUGAR 0G CARBS 3 KCAL

TESTED FOR ATHLETES

ICY BLUE RAZ

APPLIED NUTRITION

CARB-X

100% CYCLIC DEXTRIN CARBOHYDRATES

25G CARBS 0G FAT 0G SUGAR

TESTED FOR ATHLETES

UNFLAVOURED

48 SERVINGS

Why I Place So Much Value on Intra-workout Nutrition

By Adam Bates

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I had just trained arms, returned home, consumed my post workout meal and felt exhausted! I went for a lay down and quickly fell asleep. This had been a theme in my first week back to training after a few months off and I knew why. I had experienced it before and knew exactly how to change it. It was time to order my intra-workout supplements.

After a short nap I returned to my client check-ins and the first was from a new client who mentioned that they had not been consuming their intra-workout drink just yet as they had felt that they were not training hard enough to justify it. I explained a few things about the relativity of “training hard”, how those final sets if taken to failure will be training hard for them and how when it comes to weight training sweat is not a marker of how hard one may be training. I then also touched on the benefits of the intra-workout nutrition when it comes to immune system recovery and how training transiently affects the immune system in a negative way. Soon after, I received her response. What I had said had been perfectly timed, for she had trained that morning and was also completely spent after and she too had needed to take a nap.

It is also very common to see people who begin an intense exercise regimen coming down with a cold or other illness within those early weeks of their training. If you can relate to either of these experiences then it may be time for you too to consider adding some intra-workout supplements into your protocol.

Intra-workout nutrition is not new and I have tried various concoctions over the previous 20 years. I settled on a combination of essential amino acids, with higher levels of the branched chain amino acids, electrolytes and fast digesting carbohydrates. Whilst the benefits initially were considered with respect to my progress, something I have spoke on in my podcast, and which allowed me to omit the post-workout shake from my protocol, instead just having a whole food meal after training, recently I have been more interested in the benefits with respect to the recovery aspect they offer.

When we mention recovery, with respect to training, people tend to think of reducing muscle soreness and the central nervous system recovery is often something which is overlooked. Yet, it is that central nervous system recovery which is a pivotal consideration with regards to longterm progress and this is a topic I have discussed in detail many times. But it is also pivotal to the recovery of our immune system following training.

Whilst intense weight training in particular is great for our longterm health, there is a transient suppression of the immune system following a training session. The harder you train,

the greater this suppression is likely to be. So whilst the general health of someone undertaking a well constructed exercise regimen is always going to be vastly improved, over what would be the case if they were sedentary, in those first few hours following a training session they will become more susceptible to infection.

Lets get this straight - exercise is a stressor! Like any other kind of stress it will lead to an increase in cortisol levels. So whilst a healthy lifestyle along with stoic principles and perceptions will greatly improve resting cortisol levels, there is a transient increase following an intense training session. See this a little like pounding away at a punch bag when you are new to boxing. Those hands will likely hurt afterwards! But the skin over the knuckles will become tougher over time as a result. Like tearing down muscle tissue, we will build stronger muscles but in order to do so muscle fibres will be broken down first. This is how the cortisol response, and other immune system markers that are offset by it, work in response to intense training.

Lymphocytes are the type of white blood cells which are responsible for immune system defence and of which, there are 3 major types:

- T cells - responsible for cell mediated immunity
- B cells - responsible for antibody adaptive immunity
- Natural Killer (NK) cells - play a role in distinguishing and killing infected cells or tumours

Following bouts of intense activity, particularly with increasing duration, the bloods concentration levels of these lymphocytes are greatly reduced, particularly in the two hour window following the activity¹.

Immunoglobulins also play a key role in our immune systems defence mechanism. These proteins are the antibodies that can target and eliminate harmful bacteria and viruses. The marker immunoglobulin A (IgA) is often used as a measure when assessing a persons general immune system health. High stress, be it from a psychological or physiological stimulus, that results in an increase in cortisol production will result in a lower secretion of IgA and thus make a person more

¹ Walsh, N.P., M. Gleeson, R.J. Shephard, M. Gleeson, J.A. Woods, N.C.Bishop, M. Fleshner, C. Green, B.K. Pedersen, L. Hoffman-Goetz, C.J. Rogers, H. Northoff, A. Abbasi, and P. Simon (2011b). Position Statement Part One: Immune function and exercise. *Exerc. Immunol. Rev.* 17:6-63

susceptible to illness or disease. The secretion of IgA is thus, also suppressed during and following intense exercise. It is worth noting that the salivary secreted type of IgA (SIgA) which will also be surpassed, particularly with longer exercise durations can be attenuated by consuming electrolytes during the activity. Lower levels of SIgA are heavily associated with an increased risk of respiratory infections² (do you often get throat or chest infections when training?). These levels may take time to return to normal following intense activity and this leads us to become far more susceptible to infection when training frequently. That is one of the reasons why I have noticed that a EAA/BCAA supplement that also includes the electrolytes we may lose through sweat during exercise is more beneficial than consuming the amino acids alone. It is also another reason not to avoid sodium in the diet, which gets a bad rap simply because of the huge amounts used in processed foods. But avoiding it completely would be akin to never drinking water as you can drown in a huge mass of water!

It has been shown, now in numerous studies, that the ingestion of carbohydrates during intense activity will greatly suppress the transient increases in cortisol levels as well as the discussed markers that relate to immune system suppression following activity. What matters even more to myself though, is the first hand evidence over the previous 15 years with my own training and that of my clients which gives me complete confidence to say that these effects are not just marginal but are exceptional.

Another final consideration is the benefit to blood plasma glutamine levels. Glutamine is an important amino acid for immune health and its levels are heavily depleted during strenuous activity. Thus, it is often recommended to those who frequently preform at high intensities to also supplement with glutamine. However, in one particular study undertaken by cyclists, although only on a relatively small population size, the ingestion of carbohydrates during the activity actually normalised the blood plasma glutamine levels, which were severely depleted in the placebo group³.

² Neville, V., M. Gleeson, and J.P. Folland (2008). Salivary IgA as a risk factor for upper respiratory infections in elite professional athletes. *Med. Sci. Sports Exerc.* 40:1228- 1236

³ Bacurau RF, Bassit RA, Sawada L, Navarro F, Martins E Jr, Costa Rosa LF. Carbohydrate supplementation during intense exercise and the immune response of cyclists. *Clin Nutr.* 2002 Oct;21(5):423-9. doi: 10.1054/clnu.2002.0576. PMID: 12381341.

Whilst for most of my clients consuming a cheaper carbohydrate source such as dextrose or waxy maize starch will be sufficient, for myself and more serious trainees I tend to recommend branch cyclic dextrin. Due to its high molecular weight and low osmolality, branched cyclic dextrin clears the stomach and enters into the muscle cells more rapidly than pure glucose. This not only means its effects on minimising immune system adaptations are far superior to dextrose but it will also not cause any stomach issues which some may experience with other carbohydrate sources. Studies also show that performance is increased when tested to exhaustion in groups supplementing with branched cyclic dextrin over dextrose⁴. It also has a unique shape which combined with its high molecular weight allows it to shuttle other nutrients such as the BCAA's and electrolytes into the cells with it, improving the uptake of those too.

When I first began using branched cyclic dextrin around 8 years ago it was for the physique progress benefits which I initially felt with myself after continued use and then thus saw the same with my clients. However, as is the case with ageing, my recovery is not what it once was! I now notice a substantial difference in my own recovery following training when consuming branched cyclic dextrin over other carb sources.

⁴ Dylan Wilburn, Steven Macheck, Ahmed Ismaeel, Highly Branched Cyclic Dextrin and its Ergogenic Effects in Athletes: A Brief Review - Journal of exercise and nutrition 2021, Volume 4 (Issue 3): 15